FITCHBURG GAS & ELECTRIC LIGHT COMPANY

D.T.E. 99-118

DIRECT TESTIMONY AND EXHIBITS OF

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I. INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, OCCUPATION, AND BUSINESS ADDRESS.

A. My name is Samuel C. Hadaway. I am a Principal in FINANCO, Inc., Financial Analysis Consultants, 3520 Executive Center Drive, Austin, Texas 78731.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING?

A. I am testifying on behalf of Fitchburg Gas and Electric Light Company ("FG&E" or "the Company").

Q. PLEASE STATE YOUR EDUCATIONAL BACKGROUND AND DESCRIBE YOUR PROFESSIONAL TRAINING AND EXPERIENCE.

A. I have an economics degree from Southern Methodist University and MBA and Ph.D. degrees in finance from the University of Texas at Austin ("UT Austin"). I have served as an adjunct professor in the Graduate School of Business at UT Austin. I have taught economics and finance courses, and I have conducted research and directed graduate students writing in these areas. I was previously Director of the Economic Research Division at the Public Utility Commission of Texas, where I supervised the Commission's finance, economics, and accounting staff and served as the Commission's chief financial witness in electric and telephone rate cases. In various utility conferences, I have taught courses on cost of capital, capital structure, and utility financial condition, as well as courses on cost allocation and rate design issues. I have made presentations before the New York Society of Security Analysts, the National Rate of Return Analysts Forum, and various other professional and legislative groups. I have served as a vice president and on the board of directors of the Financial Management Association.

A list of my publications and testimony I have given before various regulatory bodies and in state and federal courts is contained in my resume, which is included as Appendix A.

II. PURPOSE AND SUMMARY OF TESTIMONY

Q. PLEASE STATE THE PURPOSE OF YOUR TESTIMONY AND SUMMARIZE YOUR RECOMMENDATIONS?

A. The purpose of my testimony is to estimate FG&E's market required rate of return on equity ("ROE") and to establish a reasonable ROE range for consideration in the present proceeding. I establish the reasonable cost of capital range as 100 basis points (one percent) above and below my estimated midpoint ROE. This approach is consistent with typical regulatory practice, which provides utilities an opportunity, but not a guarantee, to earn the market cost of capital. Within this regulatory framework it is well recognized that utilities' actual returns may deviate above or below the allowed ROE, and a range of 100 basis points or more is often used for earnings monitoring and other regulatory oversight purposes. In addition, as demonstrated in the remainder of my testimony, the range of 100 basis points is supported by the modeling and analysis I have used to estimate FG&E's market required rate of return on equity.

Q. PLEASE SUMMARIZE YOUR COST OF EQUITY STUDIES AND STATE YOUR ROE RECOMMENDATION.

A. My ROE recommendation is based primarily on the DCF model applied to a comparable company sample of electric utilities for which complete and reliable data are available in the *Value Line Investment Survey*. I also present a risk premium analysis based on Moody's average cost of utility debt. Given Fitchburg's small size and the current market environment faced by all regulated utilities, I believe this combination approach provides a conservative estimate of the Company's fair cost of equity capital. The data sources and the details of my return on equity studies are contained in FGE-SCH-1 through FGE-SCH-5.

My DCF analysis indicates that an ROE average of 11.3%-11.6% is appropriate. My risk premium analysis indicates that an ROE of 11.6% is appropriate. Based on these quantitative results and my review of the current market, industry, and company-specific factors discussed in the remainder of my testimony, I estimate the midpoint cost of equity for FG&E at 11.5%, with a reasonable range of 10.5%-12.5%.

III. ESTIMATING THE COST OF EQUITY CAPITAL

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. The purpose of this section is to present a general definition of the cost of equity and to compare the strengths and weaknesses of several of the most widely used methods for estimating the cost of equity. Estimating the cost of equity is fundamentally a matter of informed judgment. The various models provide a concrete link to actual capital market data and assist with defining the various relationships that underlie the ROE estimation process.

Q. PLEASE DEFINE THE TERM "COST OF EQUITY CAPITAL" AND PROVIDE AN OVERVIEW OF THE COST ESTIMATION PROCESS.

A. The cost of equity capital is the profit or rate of return that equity investors expect to receive. In concept it is no different than the cost of debt or the cost of preferred stock. The cost of equity is the rate of return that common stockholders expect, just as interest on bonds and dividends on preferred stock are the returns that investors in those securities expect. Equity investors expect a return on their capital commensurate with the risks they take and consistent with returns that might be available from other similar investments. Unlike returns from debt and preferred stocks, however, the equity return is not directly observable in advance and, therefore, it must be estimated or inferred from capital market data and trading activity.

An example helps to illustrate the cost of equity concept. Assume that an investor buys a share of common stock for $20 per share. If the stock's annual dividend is $1.30, the expected dividend yield is 6.5% ($1.30 / $20 = 6.5%). If the stock price is also expected to increase to $21 after one year, this $1.00 expected gain adds an additional 5.0% to the expected total rate of return ($1.00 / $20 = 5.0%). Therefore, buying the stock at $20 per share, the investor expects a total return of 11.5%: a 6.5% dividend yield, plus 5.0% price appreciation. In this example, the total expected rate of return at 11.5% is the appropriate

measure of the cost of equity capital, because it is this rate of return that caused the investor to commit the $20 of equity capital in the first place. If the stock were riskier, or if expected returns from other investments were higher, investors would have required a higher rate of return from the stock, which would have resulted in a lower initial purchase price in market trading.

Each day market rates of return and prices change to reflect new investor expectations and requirements. For example, when interest rates on bonds and savings accounts rise, utility stock prices usually fall. This is true, at least in part, because higher interest rates on these alternative investments make utility stocks relatively less attractive, which causes utility stock prices to decline in market trading. This competitive market adjustment process is quick and continuous, so that market prices generally reflect investor expectations and the relative attractiveness of one investment versus another. In this context, to estimate the cost of equity one must apply informed judgment about the relative risk of the company in question and knowledge about the risks and expected rates of return of other available investments.

Q. HOW DOES THE MARKET ACCOUNT FOR RISK DIFFERENCES AMONG THE VARIOUS INVESTMENTS?

A. Risk-return tradeoffs among capital market investments have been the subject of extensive financial research. Literally dozens of textbooks and hundreds of academic articles have addressed the issue. Generally, such research confirms the common sense conclusion that investors will take additional risks only if they expect to receive a higher rate of return. Empirical tests consistently show that low risk securities, such as U.S. Treasury bills, have the lowest returns; that returns from longer-term Treasury bonds and corporate bonds are higher as risks increase; and generally, returns from common stocks and other more risky investments are even higher. These observations provide a sound theoretical foundation for both the DCF and risk premium methods for estimating the cost of equity capital. These methods attempt to capture the well founded risk-return principle and explicitly measure investors' rate of return requirements.

Q. CAN YOU ILLUSTRATE THE CAPITAL MARKET RISK-RETURN PRINCIPLE THAT YOU JUST DESCRIBED?

A. Yes. The following graph depicts the risk-return relationship that has become widely known as the Capital Market Line (CML). The CML offers a graphical representation of the capital market risk-return principle. The graph is not meant to illustrate the actual expected rate of return for any particular investment, but merely to illustrate in a general way the risk-return relationship.

As a continuum, the CML can be viewed as an available opportunity set for investors. Those investors with low risk tolerance or investment objectives that mandate a low risk profile should invest in assets depicted in the lower left-hand portion of the graph. Investments in this area, such as Treasury bills and short-maturity, high quality corporate commercial paper, offer a high degree of investor certainty. In nominal terms (before considering the potential effects of inflation), such assets are virtually risk-free.

Investment risks increase as one moves up and to the right along the CML. A higher degree of uncertainty exists about the level of investment value at any point in time and about the level of income payments that may be received. Among these investments, long-term bonds and preferred stocks, which offer priority claims to assets and income payments, are relatively low risk, but they are not risk-free. The market value of long-term bonds, even those issued by the U.S. Treasury, often fluctuates widely when government policies or other factors cause interest rates to change.

Farther up the CML continuum, common stocks are exposed to even more risk, depending on the nature of the underlying business and the financial strength of the issuing corporation. Common stock risks include market-wide factors, such as general changes in capital costs, as well as industry and company specific elements that may add further to the volatility of a given company's performance. As I will illustrate in my risk premium analysis, common stocks typically are more volatile (have higher risk) than high quality bond investments and, therefore, they reside above and to the right of bonds on the CML graph. Other more speculative investments, such as stock options and commodity futures contracts, offer even higher risks (and higher potential returns). The

CML's depiction of the risk-return tradeoffs available in the capital markets provides a useful perspective for estimating investors' required rates of return.

Q. HOW IS THE FAIR RATE OF RETURN IN THE REGULATORY PROCESS RELATED TO THE ESTIMATED COST OF EQUITY CAPITAL?

A. The regulatory process is guided by fair rate of return principles established in the U.S. Supreme Court cases, *Bluefield Waterworks* and *Hope Natural Gas*:

A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. *Bluefield Waterworks & Improvement Company v. Public Service Commission of West Virginia*, 262 U.S. 679, 692-693 (1923).

From the investor or company point of view, it is important that there be enough revenue not only for operating expenses, but also for the capital costs of the business. These include service on the debt and dividends on the stock. By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital. *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591, 603 (1944).

Based on these principles, the fair rate of return should closely parallel investor opportunity costs as discussed above. If a utility earns its market cost of equity, neither its stockholders nor its customers should be disadvantaged.

Q. WHAT SPECIFIC METHODS AND CAPITAL MARKET DATA ARE USED TO EVALUATE THE COST OF EQUITY?

A. Techniques for estimating the cost of equity normally fall into three groups: comparable earnings methods, risk premium methods, and DCF methods. The first set of estimation techniques, the comparable earnings methods, has evolved over time. The original comparable earnings methods were based on book accounting returns. This approach developed ROE estimates by reviewing accounting returns for unregulated companies thought to have risks similar to those of the regulated company in question. These methods have generally been rejected because they assume that the unregulated group is earning its actual cost of capital, and that its equity book value is the same as its market value. In most situations these assumptions are not valid, and, therefore, accounting-based methods do not generally provide reliable cost of equity estimates.

More recent comparable earnings methods are based on historical stock market returns rather than book accounting returns. While this approach has some merit, it too has been criticized because there can be no assurance that historical returns actually reflect current or future market requirements. Also, in practical application, earned market returns tend to fluctuate widely from year to year. For these reasons, a current cost of equity estimate (based on the DCF model or a risk premium analysis) is usually required.

The second set of estimation techniques is grouped under the heading of risk premium methods. These methods begin with currently observable market returns, such as yields on government or corporate bonds, and add an increment to account for the additional equity risk. The capital asset pricing model (CAPM) and arbitrage pricing theory (APT) model are more sophisticated risk premium approaches. The CAPM and APT methods estimate the cost of equity directly by combining the "risk-free" government bond rate with explicit risk measures to determine the risk premium required by the market. Although these methods are widely used in academic cost of capital research, their additional data requirements and their potentially questionable underlying assumptions have detracted from their use in most regulatory jurisdictions. The risk premium methods provide a useful parallel approach with the DCF model and assure consistency with other capital market data in the cost of equity estimation process.

The third set of estimation techniques, based on the DCF model, is the most widely used regulatory cost of equity estimation method. Like the risk premium approach, the DCF model has a sound basis in theory, and many argue that it has the additional advantage of simplicity. I will describe the DCF model in detail below, but in essence its estimate of ROE is simply the sum of the expected dividend yield and the expected long-term dividend (or price) growth rate. While dividend yields are easy to obtain, estimating long-term growth is more difficult. Because the constant growth DCF model also requires very long-term growth estimates (technically to infinity), some argue that its application is too speculative to provide reliable results, resulting in the preference for the multistage growth DCF analysis.

Q. OF THE THREE ESTIMATION METHODS, WHICH DO YOU BELIEVE PROVIDES THE MOST RELIABLE RESULTS?

A. From my experience, a combination of discounted cash flow and risk premium methods provides the most reliable approach. While the caveat about estimating long-term growth must be observed, the DCF model's other inputs are readily obtainable, and the model's results typically are consistent with capital market behavior. The risk premium methods provide a good parallel approach to the DCF model and further ensure that current market conditions are accurately reflected in the cost of equity estimate.

Q. PLEASE EXPLAIN THE DCF MODEL.

A. The DCF model is predicated on the concept that stock prices represent the present value or discounted value of all future dividends that investors expect to receive. In the most general form, the DCF model is expressed in the following formula:

$P_0 = D_1/(1+k) + D_2/(1+k)^2 + ... + D_\infty/(1+k)^\infty$ (1)

where P_0 is today's stock price; D_1, D_2, etc. are all future dividends and k is the discount rate, or the investor's required rate of return on equity. Equation (1) is a routine present value calculation based on the assumption that the stock's price is the present value of all dividends expected to be paid in the future.

Under the additional assumption that dividends are expected to grow at a constant rate "g" and that k is strictly greater than g, equation (1) can be solved for k and rearranged into the simple form:

$k = D_1/P_0 + g$ (2)

Equation (2) is the familiar constant growth DCF model for cost of equity estimation, where D_1/P_0 is the expected dividend yield and g is the long-term expected dividend growth rate.

Under circumstances when growth rates are expected to fluctuate or when future growth rates are highly uncertain, the constant growth model may not give reliable results. Although the DCF model itself is still valid [equation (1) is mathematically correct], under such circumstances the simplified form of the model must be modified to capture market expectations accurately.

Recent events and current market conditions in the utility industry, as discussed in Section III, appear to challenge the constant growth assumption of the traditional DCF model. Since the mid-1980s, dividend growth expectations for many utilities have fluctuated widely. In fact, almost half of the electric utilities in the U.S. have reduced or eliminated their common dividends during this period. Some of these companies have reestablished their dividends, producing exceptionally high growth rates. Under these circumstances, long-term growth rate estimates have become highly uncertain, and estimating a reliable "constant" growth rate for many companies is virtually impossible. Under these conditions, singular reliance on the traditional constant growth DCF model may not be appropriate.

Q. HOW CAN THE DCF MODEL BE APPLIED WHEN THE CONSTANT GROWTH ASSUMPTION IS VIOLATED?

A. When growth expectations are uncertain, the more general version of the model represented in equation (1) should be solved explicitly over a finite "transition" period while uncertainty prevails. The constant growth version of the model can then be applied after the transition period, under the assumption that more stable conditions will prevail in the future. There are two alternatives for dealing with the nonconstant growth transition period.

Under the "terminal price" nonconstant growth approach, equation (1) is written in a slightly different form:

$$P_0 = D_1/(1+k) + D_2/(1+k)^2 + ... + P_T/(1+k)^T \quad (3)$$

where the variables are the same as in equation (1) except that P_T is the estimated stock price at the end of the transition period T. Under the assumption that normal growth resumes after the transition period, the price P_T is then expected to be based on constant growth assumptions. With the terminal price approach, the estimated cost of equity, k, is just the rate of return that investors would expect to earn if they bought the stock at today's market price, held it and received dividends through the transition period (until period T), and then sold it for price P_T. In this approach, the analyst's task is to estimate the rate of return that investors expect to receive given the current level of market prices they are willing to pay.

Under the "multistage" nonconstant growth approach, equation (1) is simply expanded to incorporate two or more growth rate periods, with the assumption that a permanent constant growth rate can be estimated for some point in the future:

$$P_0 = D_0(1+g_1)/(1+k) + ... + D_0(1+g_2)^n/(1+k)^n +$$

$$... + D_0(1+g_T)^{(T+1)}/(k-g_T) \quad (4)$$

where the variables are the same as in equation (1), but g_1 represents the growth rate for the first period, g_2 for a second period, and g_T for the period from year T (the end of the transition period) to infinity. The first two growth rates are simply estimates for fluctuating growth over "n" years (typically 5 or 10 years) and g_T is a constant growth rate assumed to prevail forever after year T. The difficult task for analysts in the multistage approach is determining the various growth rates for each period.

Although less convenient for exposition purposes, the nonconstant growth models are based on the same valid capital market assumptions as the constant growth version. The nonconstant growth approach simply requires more explicit data inputs and more work to solve for the discount rate, k. Fortunately, the required data are available from investment and economic forecasting services, and computer algorithms can easily produce the required solutions. Both constant and nonconstant growth DCF analyses are presented in the following section.

Q. PLEASE EXPLAIN THE RISK PREMIUM METHODOLOGY.

A. Risk premium methods are based on the assumption that equity securities are riskier than debt and, therefore, that equity investors require a higher rate of return. This basic premise is well supported by legal and economic distinctions between debt and equity securities, and it is widely accepted as a fundamental capital market principle. For example, debt holders' claims to the earnings and assets of the borrower have priority over all claims of equity investors. The contractual interest on mortgage debt must be paid in full before any dividends can be paid to shareholders, and secured mortgage claims must be fully satisfied before any assets can be distributed to shareholders in bankruptcy. Also, the guaranteed, fixed-income nature of interest payments makes year-

to-year returns from bonds typically more stable than capital gains and dividend payments on stocks. All these factors demonstrate the more risky position of stockholders and support the equity risk premium concept.

Q. ARE RISK PREMIUM ESTIMATES OF THE COST OF EQUITY CONSISTENT WITH OTHER CURRENT CAPITAL MARKET COSTS?

A. Yes. The risk premium approach is especially useful because it is founded on current market interest rates, which are directly observable. This feature assures that risk premium estimates of the cost of equity begin with a sound basis, which is tied directly to current capital market costs.

Q. IS THERE SIMILAR CONSENSUS ABOUT HOW RISK PREMIUM DATA SHOULD BE EMPLOYED?

A. No. In regulatory practice, there is often considerable debate about how risk premium data should be interpreted and used. Since the analyst's basic task is to gauge investors' required returns on long-term investments, some argue that the estimated equity spread should be based on the longest possible time period. Others argue that market relationships between debt and equity from several decades ago are irrelevant and that only recent debt-equity observations should be given any weight in estimating investor requirements. There is no consensus on this issue. Since analysts cannot observe or measure investors' expectations directly, it is not possible to know exactly how such expectations are formed or, therefore, to know exactly what time period is most appropriate in a risk premium analysis.

The important point is to answer the following question: "What rate of return should equity investors reasonably expect relative to returns that are currently available from long-term bonds?" The risk premium studies and analyses I discuss in Section V address this question. My risk premium recommendation is based on an intermediate position that avoids some of the problems and concerns that have been expressed about both very long and very short periods of analysis with the risk premium model.

Q. PLEASE SUMMARIZE YOUR DISCUSSION OF COST OF EQUITY ESTIMATION TECHNIQUES.

A. Estimating the cost of equity is one of the most controversial issues in utility ratemaking. Because actual investor requirements are not directly observable, several methods have been developed to assist in the estimation process. The comparable earnings method is the oldest but perhaps least reliable. Its use of accounting rates of return, or even historical market returns, may or may not reflect current investor requirements. Differences in accounting methods among companies and issues of comparability also detract from this approach.

The DCF and risk premium methods have become the most widely accepted in regulatory practice. A combination of the DCF model and a review of risk premium data provides

the most reliable cost of equity estimate. While the DCF model does require judgment about future growth rates, the dividend yield is straightforward, and the model's results are generally consistent with actual capital market behavior. For these reasons, I will rely on a combination of the DCF model and a risk premium analysis in the cost of equity studies that follow in Section V of this testimony.

IV. FUNDAMENTAL FACTORS THAT AFFECT THE COST OF EQUITY CAPITAL

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. The purpose of this section is to review recent capital market costs and conditions as well as industry- and Company-specific factors that should be reflected in the cost of equity capital in this case.

Q. WHAT HAS BEEN THE RECENT EXPERIENCE IN THE U.S. CAPITAL MARKETS?

A. Exhibit FGE-SCH-1 provides a review of annual interest rates and rates of inflation for the U.S. economy since 1991. During this period, inflation and capital market costs have been relatively low. Inflation, as measured by the Consumer Price Index, fell to below 2% in 1998, a level not seen consistently since the 1960s. More recently, however, rising energy prices and continuing economic growth have increased the inflation rate again to over 3.0%. Long-term interest rates have followed a similar pattern, in 1998 dipping to their lowest levels in 30 years. The 30-year Treasury bond rate dropped to near 5% in October 1998. Since then, however, the Treasury bond rate has fluctuated widely within a range of 5.25% to over 6.5%, and widening interest rate spreads for corporate debt relative to government bonds have significantly increased the relative corporate cost of capital.

Increasing uncertainty and extreme volatility in world-wide capital markets have changed many of the traditional cost of capital relationships. The 1998 "flight to safety" following the Asian financial crisis caused literally billions of dollars to flow out of more risky investments and into U.S. Treasury bonds. More recently, unusual supply and demand conditions for U.S. Treasuries and extreme turbulence in the world-wide equity markets have caused further market anomalies, with the government rate declining much more rapidly than rates on other securities.

These relationships are borne out in market data. For example, prior to the events of 1998, for the 15 years ended in 1997, rates on single-A industrial bonds averaged 116 basis points (1.16%) above long-term Treasury bonds. During the month of October 1998, the industrial single-A spread widened to 172 basis points. The average public utility spread was even wider at 186 basis points. The widening spread relationship has continued, with the recent (March 2001) average utility rate spread over 30-year Treasuries at 225 basis points. These relationships reflect increasing concerns about capital market risks and vividly illustrate the increasing corporate cost of capital relative to U.S. Treasury bond interest rates.

Exhibit FGE-SCH-2 provides a summary of Moody's Triple-B Utility Bond Yields for the most recent three months (January-March 2001). For the three-month period, the Average Utility Bond Yield was 7.68%, with single-A and triple-B rates at 7.74% and 7.93%, respectively.

Q. HOW HAVE UTILITY STOCKS PERFORMED DURING THE PAST 12 MONTHS?

A. Stock prices for many utility companies have fluctuated widely during the past year. Prices rose significantly during most of 2000, but dropped precipitously in January 2001 with investors' attention focused closely on the California energy crisis. Prices have continued to drift lower, and the recent Dow Jones Utility Average, at 385.58 (April 20, 2001), is about 6.5% below the record high levels reached in December 2000.

Q. HOW DO CAPITAL MARKET CONDITIONS AND INVESTOR CONCERNS AFFECT THE COST OF EQUITY CAPITAL?

A. As I discussed previously in Section III, equity investors respond to changing assessments of risk and financial prospects by changing the price they are willing to pay for a given security. When risk perceptions increase or financial prospects decline, investors reduce the previously existing market price for a company's securities and market supply and demand determine a new lower price. The lower market price typically translates to a higher cost of capital through a higher dividend yield requirement as well as the potential for increased capital gains if prospects improve. In addition to market losses for prior shareholders, the higher cost of capital is transmitted directly to the company by the need to issue more shares to raise any given amount of capital for future investment. The additional shares also impose additional future dividend requirements and reduce future earnings per share growth prospects.

Q. WHAT IS THE CURRENT FUNDAMENTAL POSITION OF THE ELECTRIC UTILITY INDUSTRY?

A. The greatest consideration for utility investors is the industry's transition to competition. With the passage of the National Energy Policy Act (NEPA) in 1992 and the Federal Energy Regulatory Commission's (FERC) Order 888 in 1996, the stage was set for vastly increased competition in the electric utility industry. NEPA's mandate for open access to the transmission grid and FERC's implementation through Order 888 effectively opened the market for wholesale electricity to competition. Previously protected utility service territory and lack of transmission access in some parts of the country had limited the availability of competitive bulk power prices. NEPA and Order 888 have essentially eliminated such constraints for incremental power needs.

In addition to wholesale issues at the federal level, many states like Massachusetts are implementing retail access and opening the entire market to competition. Investors' concerns about such efforts have focused on appropriate transition mechanisms and methods for dealing with potentially stranded costs. The California energy crisis recently

has refocused market concerns and further increased utility capital costs. As expected, the opening of previously protected utility markets to competition, and the uncertainty created by the removal of regulatory protection, has raised the level of uncertainty about investment returns across the entire electric utility industry.

Q. IS FG&E AFFECTED BY THESE SAME MARKET UNCERTAINTIES AND INCREASING UTILITY CAPITAL COSTS?

A. Yes. To some extent all electric utilities are being affected by the industry's transition to competition. Based on FG&E's restructuring plan in Massachusetts, which was approved by the Commission January 15, 1999, customers have the ability to choose an energy supplier or an option to purchase Standard Offer Service provided by FG&E at regulated prices. Customers continue to receive a cumulative inflation adjusted rate reduction of 15%. In effect, FG&E remains the provider of last resort and bears the potential middle-man risks of nonpayment or failure of energy service providers. As note my Mr. Collin, a great deal of uncertainty also remains with respect to FG&E's recovery of certain transition costs and other costs and reconciliation calculations related to the restructuring process. Additionally, although FG&E has a defined service territory, the Company faces competition from self generation and distributed generation that may reduce the use, and thus the value, of its distribution system.

V. COST OF EQUITY CAPITAL FOR FG&E

Q. WHAT IS THE PURPOSE OF THIS SECTION OF YOUR TESTIMONY?

A. The purpose of this section is to present my quantitative studies of the cost of equity capital for FG&E and to discuss the details and results of my analyses.

Q. HOW ARE YOUR STUDIES ORGANIZED?

A. I first apply the DCF model to a sample of widely-held, publicly-traded electric utility companies. The sample consists of relatively low risk single-A and higher rated companies followed by *Value Line* that have at least 75% of total revenues from domestic electric sales and for which adequate data are available. The DCF results are summarized in Exhibit FGE-SCH-4, page 1 of 5. The DCF model range is 10.6%-11.9%, with average results for the electric group at 11.3%-11.6%. In the second part of my analysis, I develop cost of equity estimates based on the risk premium approach. That analysis, which is based on U.S. state regulatory allowed ROEs relative to contemporaneous utility debt costs for the period 1980-2000, indicates a cost of equity of 11.6%. I have also reviewed other risk premium studies, as discussed later in my testimony, that indicate a cost of equity capital range of 12.8%-13.4%. Given current market and utility industry conditions, I believe the risk premium approach adds important perspective for judging current investor requirements. Based on my DCF and risk premium studies and my review of the current market, industry, and company-specific factors discussed above, I estimate the midpoint cost of equity capital for FG&E at 11.5%.

A. COMPARABLE COMPANY DCF ANALYSIS

Q. WHAT STOCK PRICES ARE USED IN YOUR DCF ANALYSES?

A. Throughout my DCF analyses I use average stock prices from the most recent three month period consistent with the date for which data from *Value Line* are available for each company. Although technically either average or spot stock prices can be used in a DCF analysis, a reasonably current price consistent with present market conditions and the other data employed in the analysis is most appropriate. Since the cost of equity is a current and forward-looking concept, the important issue is that the price should be representative of current market conditions and not unduly influenced by unusual or special circumstances. I calculate, in Exhibit FGE-SCH-3, the average of high and low prices for each of the three months ending March 2001 for each company in my comparable company group. This three-month period ending March 2001 is consistent with the latest available Value Line data. The averages of these three-month data are employed in the dividend yield calculations for the DCF model presented below.

Q. PLEASE SUMMARIZE THE RESULTS OF YOUR DCF ANALYSES.

A. The results from my DCF analyses are summarized in my Exhibit SCH-4, page 1 of 5. The constant growth DCF model indicates that a range of 11.5% to 11.7% is appropriate. The more volatile nonconstant growth Market Price DCF Model indicates an ROE range of 10.6%-11.3%. The Ten-Year Transition to Competition DCF model indicates an ROE range of 11.7%-11.9%. The average of the electric utility DCF results indicates that an ROE range of 11.3%-11.6% is appropriate.

B. RISK PREMIUM ANALYSIS

Q. WHAT ARE THE RESULTS OF YOUR RISK PREMIUM ANALYSIS?

A. My risk premium results are shown in Exhibits FGE-SCH-5. My analysis compares average ROEs allowed for electric utilities each year by the various state regulatory commissions to contemporaneous utility debt costs for the period 1980-2000. These studies indicate an average risk premium of 3.88% for electric company decisions. When this risk premium is added to the recent average utility debt cost (7.68%), the resulting ROE is 11.6%. (7.68% + 3.88% = 11.56%).

Q. HOW ARE YOUR RISK PREMIUM STUDIES STRUCTURED?

A. My risk premium studies are divided into two parts. First, I compare electric utility authorized ROEs for the period 1980-2000 to contemporaneous long-term utility debt rates. The differences between the annual average authorized ROEs and the average cost of utility debt for each year is the indicated annual equity risk premium. The risk premium data show that risk premiums are small when interest rates are high and larger when interest rates are low. For example, in the early 1980s when utility interest rates exceeded 15%, allowed ROEs were generally less than 2% above the cost of debt. In

more recent years, with much lower interest rates, allowed ROEs have typically exceeded debt costs by 3.5%-4.0%.

The inverse relationship between risk premiums and interest rate levels is well documented in numerous, well respected academic studies.

(1) These studies typically use regression analysis or other statistical methods to predict or measure the risk premium relationship under varying interest rate conditions. On page 2 of Exhibit FGE-SCH-5, I present a regression analysis of the allowed annual equity risk premiums relative to interest rate levels. The negative and statistically significant regression coefficients confirm the inverse relationship between risk premiums interest rates and indicates that risk premiums expand and contract with interest rate changes. This means that when interest rates rise by 1 percentage point, the cost of equity increases by a smaller amount. Similarly, when interest rates decline by 1 percentage point, the cost of equity declines by less than 1 percentage point. I use the negative interest rate change coefficient in conjunction with current interest rates to establish the appropriate current equity risk premium. These calculations are shown in the lower portion of page 1 of my Exhibit FGE-SCH-5.

Q. HOW DO THE RESULTS OF YOUR RISK PREMIUM STUDY COMPARE TO LEVELS FOUND IN OTHER PUBLISHED RISK PREMIUM STUDIES?

A. Based on my risk premium studies, I am recommending lower risk premium than is often found in other published risk premium studies. For example, the most widely followed risk premium data are provided in studies published annually by Ibbotson Associates.(2) These data, for the period 1926-1999, indicate an arithmetic mean risk premium of 7.4% for common stocks versus long-term corporate bonds. Under the assumption of geometric mean compounding, Ibbotson's risk premium for common stocks versus corporate bonds is 6.2%. Ibbotson argues extensively for the arithmetic mean approach as the appropriate basis for estimating the cost of equity. Even with the more conservative geometric mean risk premium, Ibbotson's data indicate an average utility cost of equity of over 13% (7.68% debt cost + 5.7% risk premium = 13.38%).

The Harris and Marston (H&M) study noted above also provides specific equity risk premium estimates. Using analysts' growth estimates to estimate equity returns, H&M found equity risk premiums of 6.47% relative to U.S. Government bonds and 5.13% relative to yields on corporate debt. H&M's equity risk premium relative to corporate debt indicates an average utility cost of equity of over 12% (7.68% debt cost + 5.13% risk premium = 12.81%).

VI. CONCLUSION

Q. PLEASE SUMMARIZE THE RESULTS OF YOUR COST OF EQUITY ANALYSIS.

A. The following table summarizes my results:

Summary of Cost of Equity Estimates

DCF Analyses

Electric Utility DCF Models

Constant Growth Model 11.5%-11.7%

Four-Year Market Price Model 10.6%-11.3%

Transition to Competition Model 11.7%-11.9%

Electric Utility DCF Model Average 11.3%-11.6%

Risk Premium Analyses Indicated Cost

Utility Debt Cost + Risk Premium

Electric Risk Premium Analysis (7.68% + 3.88%) 11.6%

Ibbotson Risk Premium Analysis

Risk Premium (7.68% + 5.7%) 13.4%

Harris-Marston Risk Premium

Risk Premium (7.68% + 5.13%) 12.8%

FG&E Cost of Equity Range 10.5%-12.5%

Q. HOW SHOULD THESE RESULTS BE INTERPRETED TO ESTIMATE THE FAIR COST OF EQUITY FOR THE COMPANY?

A. Based on the quantitative results from my DCF and risk premium analyses and my review of current market, industry, and company-specific conditions, I estimate the fair cost of equity for FG&E at 11.50%, with a reasonable range of 10.5%-12.5%.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

1.

[1] See, for example, Robert S. Harris and Felicia C. Marston, "Estimating Shareholder Risk Premia Using Analysts' Growth Forecasts," Financial Management, Summer 1992.

2.

[2] Ibbotson Associates, *Stocks, Bonds, Bills and Inflation 2000 Yearbook.*